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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/693,429

10/23/2003

J. Rodney Walton

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QUALCOMM INCORPORATED  
5775 MOREHOUSE DR.  
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EXAMINER

SMITH, MARCUS

ART UNIT

PAPER NUMBER

2619

NOTIFICATION DATE

DELIVERY MODE

08/21/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/693,429	<b>Applicant(s)</b> WALTON ET AL.	
	<b>Examiner</b> MARCUS R. SMITH	<b>Art Unit</b> 2619	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35-86 is/are pending in the application.
- 4a) Of the above claim(s) 1-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 35-41, 48-50, 53-56, 60-68, 70-71, 73-74, 76-78, 80-82, 84, and 85 is/are rejected.
- 7) ☒ Claim(s) 42-47, 51, 52, 57-59, 69, 72, 75, 79, 83 and 86 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/30/04</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's election with traverse of group 4 (claims 40-48) in the reply filed on 5/05/08 is acknowledged. The traversal is on the ground(s) that claims 40-48 are receive versions of the transmit claims 35-39 (group 3). This is found persuasive, so the examiner will examine both groups.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Objections***

2. Claims 52 objected to because of the following informalities: they are two claims that are number 52. One of those claims should have been numbered 53. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 35-41, 48-50, 53-56, 60-68, 70-71, 73-74, 76-78, 80-82, 84, and 85 are rejected under 35 U.S.C. 102(e) as being anticipated by Paulraj et al. (US 6,351,499) see IDS 8/30/04.

with regard to claim 35, 39, 61, 64, Paulraj teaches (see figure 3):

A method of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

coding and modulating a first plurality of data streams to obtain a first plurality of data symbol streams (column 7, lines 10-20: S-T-coding unit, 66);

spatially processing the first plurality of data symbol streams with a first plurality of steering vectors to obtain a first plurality of transmit symbol streams for transmission from a plurality of antennas to a first user terminal in a first transmission interval (column 8, lines 34-56: transmit processing unit, 72);

coding and modulating a second plurality of data streams to obtain a second plurality of data symbol streams (column 7, lines 10-20: S-T-coding unit, 66); and

providing the second plurality of data symbol streams as a second plurality of transmit symbol streams for transmission from the plurality of antennas to a second user terminal in a second transmission interval (column 8, lines 34-56: transmit processing unit, 72).

with regard to claim 40, 48, 67, and 70, Paulraj teaches (see figure 4):

An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a receive spatial processor operative to perform receiver spatial processing on a first plurality of received symbol streams in accordance with a first spatial multiplexing mode to obtain a first plurality of recovered data symbol streams (column 9, lines 24-50: receive processing block, 86), and

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perform receiver spatial processing on a second plurality of received symbol streams in accordance with a second spatial multiplexing mode to obtain a second plurality of recovered data symbol streams (column 9, lines 24-50: receive processing block, 86); and

a receive data processor operative to demodulate and decode the first plurality of recovered data symbol streams in accordance with a first plurality of rates to obtain a first plurality of decoded data streams (column 9, lines 50-67: S-T decoding unit, 88), and

demodulate and decode the second plurality of recovered data symbol streams in accordance with a second plurality of rates to obtain a second plurality of decoded data streams (column 9, lines 50-67: S-T decoding unit, 88).

with regard to claim 49, 54, 55, 73, 77, Paulraj teaches (see figure 3):

A method of transmitting data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

receiving information indicating a spatial multiplexing mode and a plurality of rates to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the plurality of rates is selected from among a set of rates supported by the system (column 7, lines 40-56: adaptive controller, 60);

coding and modulating a plurality of data streams in accordance with the plurality of rates to obtain a plurality of data symbol streams (column 7, lines 10-20: S-T-coding unit, 66); and

spatially processing the plurality of data symbol streams in accordance with the spatial multiplexing mode to obtain a plurality of transmit symbol streams for transmission from a plurality of antennas (column 8, lines 34-56: transmit processing unit, 72)

with regard to claims 81 and 84,

An apparatus of receiving data in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for receiving information indicating a spatial multiplexing mode and at least one rate to use for data transmission, wherein the spatial multiplexing mode is selected from among a plurality of spatial multiplexing modes supported by the system, and wherein each of the at least one rate is selected from among a set of rates supported by the system (column 10, lines 47-65);

means for spatially processing at least one received symbol stream in accordance with the spatial multiplexing mode to obtain at least one recovered data symbol stream (column 7, lines 10-20: S-T-coding unit, 66); and

means for demodulating and decoding the at least one recovered data symbol stream in accordance with the at least one rate to obtain at least one decoded data stream (column 9, lines 50-67: S-T decoding unit, 88).

with regard to claims 36, 62, 65:

deriving the first plurality of steering vectors such that the first plurality of data streams are transmitted on a plurality of orthogonal spatial channels of a first MIMO channel for the first user terminal (column 10, lines 15-30).

with regard to claim 37, 63, 66:

coding and modulating a third plurality of data streams to obtain a third plurality of data symbol streams (column 7, lines 10-20: S-T-coding unit, 66); and

spatially processing the third plurality of data symbol streams with a second plurality of steering vectors to obtain a third plurality of transmit symbol streams for transmission from the plurality of antennas to a plurality of user terminals in a third transmission interval (column 8, lines 34-56: transmit processing unit, 72).

with regard to claim 38:

deriving the second plurality of steering vectors such that the third plurality of data streams are received with suppressed crosstalk at the plurality of user terminals (column 10, lines 15-30).

with regard to claims 41, 50, 56, 68, 71, 74, 78, 82, and 85:

The method of claim 40, wherein the first spatial multiplexing mode is a steered spatial multiplexing mode, and wherein the first plurality of received symbol streams are spatially processed with a plurality of eigenvectors for a plurality of spatial channels of a MIMO channel for a user terminal (column 11, lines 1-15).

with regard to claim 52, 76, and 80:

The method of claim 49, further comprising: performing calibration so that uplink channel response is reciprocal of downlink channel response (column 10, lines 56-65).

5. Claims 42-47, 51-52, 57-59, 69, 72, 75, 79, 83, and 86 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCUS R. SMITH whose telephone number is (571)270-1096. The examiner can normally be reached on Mon-Thurs: 7:30 am - 5:00 p.m. and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MRS 8/14/08  
/CHAU T. NGUYEN/  
Supervisory Patent Examiner, Art Unit 2619



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